REMARKS

Applicants elected invention Group I claims in the reply filed on October 13, 2006. Claims 17-25 and 31-41 are canceled. Claims 1-16 and 26-30 are pending, and claims 1-16 and 26-30 stand rejected. By this Amendment, claims 1 and 9 are amended. Further, the specification has been amended, including to update the use of application serial numbers and to correct for improper use of trademarks. Further, two sections have been added to the specification. Support for the amendments to the specification can be found throughout the application and, for example, in the claims as originally filed. No new matter is believed to have been introduced in the amendments to the claims or the amendments to the specification.

Objection to the Abstract

The Examiner objected to the abstract of the disclosure because it is not limited to a single paragraph. MPEP §608.01(b). The abstract of the disclosure has been corrected such that the abstract to the disclosure is now a single paragraph. Reconsideration and withdrawal of the objection to the abstract of the disclosure are respectfully requested.

Objection to the Specification

The Examiner noted that the specification discloses that one or more of the methylene groups in the $-(CH_2)_m-$ group can be replaced by N, C, B, P, or a CR_4. The Examiner asserted that it was unclear how a methylene group, which is divalent, can be replaced with groups that are not divalent.

The specification has been amended to remove the substitution of the methylene group by N, C, B, or P. Regarding substitution of CR_4 for the methylene group in the backbone chain of the chemical structure, R_4 can be H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring. If R_4 is substituted by, for example, an H atom or an alkyl group, one bonding position (bonding orbital) remains open on the carbon atom of the CR_4. However, one of ordinary skill in the art at the time the invention was made would understand that if the open position was to be filled with a subtituent such as an H atom, then the CR_5R_6 substitution would be used for the methylene group. Hence, something different is expected. Instead, the available bonding position is used to form a double-bond, since a chemical substituent is not intended for the open position. Examples of this concept are included in exhibits attached hereto. Therefore, reconsideration and withdrawal of the objection to the specification are respectfully requested.

Further, the Examiner noted that the R groups in the NR_3, CR_4 and CR_5R_6 groups can be a bond. The Examiner asserted that it is not clear with what the R bonds form a bond. The specification has been amended, solely to advance prosecution of the patent application, by removing the term wherein R can be "a bond". Therefore, reconsideration and withdrawal of the objection to the specification are respectfully requested.

The Examiner noted that the specification discloses that one or more of the methylene groups in the $-(CH_2)_m-$ group can be replaced by a NR_3 group, a CR_4 group or a CR_5R_6 group, where the R groups can be part of a ring group. The Examiner asserted that it is not clear what is meant by the term "part of a ring group", and that the specification does not define said group.

One of ordinary skill in the art would understand that term "part of a ring group" refers to an atom or group that is bonded to other atoms or groups that form a ring system. For example, a carbon atom in a benzyl group is a part of a ring group. Particularly, for example, this terminology allows for the possibility of R_3, R_4, R_5, R_6, or combinations of the R groups, to jointly form a ring group. Applicants have attached as exhibits to this response several pages from Internet web sites showing exemplary use of the term "part of a ring structure." As used throughout the attached pages, the term "part of a ring structure" relates to an atom or group bonded to other atoms or groups to form a ring system. Moreover, U.S. patent subclass 536/26.11 relates to compounds where "phosphorous is part of a ring." For example, U.S. Patent No. 6,812,342 is classified in subclass 536/26.11, and Figs. 2 and 3 of the '342 patent depict a phosphorus group forming part of a ring structure (i.e., bonded to other atoms or groups in a ring). Further, the term "part of a ...ring" is used in U.S. Patent No. 6,951,930 to Dempcy et al. at, for example, column 17, lines 40-45 and column 18, lines 42-46. Thus, the term "part of a ring" structure or group is understood by one of ordinary skill in the art, and by the PTO, to mean an atom or group that is bonded to other atoms or groups to form a ring system. Since one of ordinary skill in the art would understand the scope of the term "part of a ring group," the specification is sufficiently clear. Reconsideration and withdrawal of the objection to the specification are respectfully requested.

Objection to the Specification Due to Improper Trademark Use

The Examiner noted that trademarks should be capitalized wherever they appear and be accompanied by the generic terminology. The Examiner provided the example of, e.g. Calgon,

at page 13, line 22, and indicated that the example is not exhaustive. The specification and been reviewed and amended to show proper use of trademarks. Reconsideration and withdrawal of the objection to the specification, as it relates to trademark use, is respectfully requested.

Objection to the Specification Due to Reference to Serial US Applications

The Examiner noted that the instant specification references serial US applications by their serial numbers, but does not provide the current status of the applications. The Examiner requested that the current status of all of the US applications disclosed in the instant specification be provided and that the status be updated in each response in the future. The status of the applications noted in the specification has been updated via amendment of the specification. Therefore, reconsideration and withdrawal of the objection to the specification is respectfully requested.

Objection to the Specification: Failing to Provide Antecedent Basis for Claimed Subject Matter

The Examiner objected to claims 4, 12, and 29, asserting that the recitation E_1 and E_2 are, each independently, an oxiranyl ring" lacks antecedent basis in the specification. Further, the Examiner asserted that the formula in claims 5, 13, and 30, lacks antecedent basis in the specification. The Examiner asserted that the specification discloses the charge transport materials having the structures shown in formulas (2) and (3). The carbazolyl moietites in formulas (2) and (3) are either unsubstituted or substituted at the 6-position with a chlorine atom. The Examiner asserted that the formula recited in claims 5, 13, and 30 is broader than the two particular formulas (2) and (3) because the R groups on the carbazolyl moieties are not limited to

be hydrogen or chlorine atoms at the 6-position. The objections to the specification are respectfully traversed.

In the instance of the provided *examples* ((2) and (3)), E_1 and E_2 are, each independently, an epoxy group, an unsubstituted oxiranyl group. The specification further notes at page 12, lines 14-16, that "When referring to an epoxy group, the substituent cited includes any substitution that does not destroy the 3-membered ring structure of the epoxy group." Further, the specification has been amended to clarify that the oxiranyl ring can be substituted or unsubstituted. Support for the amendment to the specification can be found for example, in the claims as originally filed (specifically claims 4, 12, and 29). Reconsideration and withdrawal of the objection to the specification due to lack of antecedent basis for the term "oxiranyl ring" in the claims is respectfully requested.

Claims 5, 13, and 30 depend from independent claims 1, 9, and 26, respectively. Claims 1, 9 and 26 recite that Y_1 and Y_2 comprise, each independently, a carbazolyl group. Further, at page 11, line 27 – page 12, line 19, it is noted that substitution is liberally allowed on the chemical groups to affect various physical effects on the properties of the compounds. Further, the term *group* indicates that the generically recited chemical entity may have any substituent thereon which is consistent with the bond structure of that group. The example of a phenyl group is provided, where substitution is acceptable (e.g. 1-aminophenyl, 1,3,5-trithiophenyl) if the substitution does not require the ring bond structure of the phenyl group to be altered to a non-aromatic form because of the substitution (e.g. 1,1,2,2,3,3-hexamethylphenyl). Very purposefully, the term "moiety" is not used in the claim, although the term is defined in the specification.

The term in independent claims 1, 9, and 26, as originally filed, used with respect to carbozolyl is carbazolyl *group*. Hence, substitution on the carbazolyl group is allowed, so long as the ring bond structure of the carbazolyl group is left unaffected. Further, the structures provided (e.g. (2) and (3)) are provided as "[s]pecific, non-limiting *examples* of suitable charge transport material within the general Formula (1)..." (emphasis added) and are not to limit substitution.

Finally, the specification has been amended to provide antecedent basis for the claimed subject matter, in particular, the formula listed in claims 5, 13, and 30. Support for the amendment to the specification can be found in the application and, for example, in the originally filed claims 5, 13, and 30, which themselves are considered part of the disclosure of the application. Reconsideration and withdrawal of the objection to the specification as failing to provide proper antecedent basis for the claimed subject matter are respectfully requested.

Claim Rejections Under 35 U.S.C. §112

The Examiner rejected claims 1-16 and 26-30 under 35 U.S.C. §112, second paragraph, as being indefinite. The Examiner asserted that instant claims 1, 9, and 26 are indefinite in the phrase "X_1 and X_2...have the formula $-(CH_2)_m-$ group, branched or linear, where m is an integer between 0 and 20, inclusive", because it is not clear how the $-(CH_2)_m-$ group can be branched. The Examiner asserted that branching in an aliphatic carbon chain requires, for example, at least a –(CHR)- group, where R is an alkyl group. The rejection under 35 U.S.C. §112 is respectfully traversed.

The specification has been amended for clarification and to remove redundancy. The specification indicated that the groups X_1 and X_2 can be groups having the formula $-(CH_2)_m-$, where one or more of the methylene groups can be replaced by a CR_4 group, or a CR_5R_6 group. Hence, branching of the methylene group is already provided. Reconsideration and withdrawal of the rejection of claims 1, 9, and 26, and claims 2-8, 10-16, and 27-30 as depending from claims 1, 9, and 26, respectively, due to use of the term "branched" in association with the group $-(CH_2)_m-$ is respectfully requested.

The Examiner further asserted that claims 1, 9, and 26 are indefinite in the phrase "...one or more of the methylene groups is optionally replaced by a ...N, C, B, P, ...a CR_4 ..." because it is not clear how a methylene group, which is divalent, can be replaced with groups that are not divalent. The rejection is respectfully traversed.

The specification has been amended to remove the substitution of the methylene group by N, C, B, or P. Where CR_4 is substituted for the methylene group in the backbone chain of the chemical structure, R_4 can be H, hydroxyl, thiol, carboxyl, an amino group, an alkyl group, an alkenyl group, a heterocyclic group, an aromatic group, or part of a ring. If R_4 is substituted by, for example, an H atom or an alkyl group, one bonding position (bonding orbital) remains open on the carbon atom of the CR_4. However, one of ordinary skill in the art at the time the invention was made would understand that if the open position was to be filled with a subtituent such as an H atom, then the CR_5R_6 substitution would be used for the methylene group. Hence, something different is expected. Instead, the available bonding position is used to form a double-bond, since a chemical substituent is not intended for the open position. Examples of this concept are included herein. Therefore, reconsideration and withdrawal of the rejection of claims 1, 9, and

26 and claims 2-8, 10-16, and 27-30 as depending from claims 1, 9, and 26, respectively, are respectfully requested.

The Examiner asserted that claims 1, 9, and 26 are indefinite in the phrase "...one or more of the methylene groups is optionally replaced by ...an NR_3 group, a CR_4 group, or a CR_5R_6 group" where the R groups can be "a bond" because it is not clear with what the R bonds form. The rejection is respectfully traversed.

The specification has been amended, solely to advance prosecution of the patent application, by removing the term wherein R can be "a bond". Therefore, reconsideration and withdrawal of the rejection of claims 1, 9, and 26 and claims 2-8, 10-16, and 27-30 as depending from claims 1, 9, and 26, respectively, due to R being able to be "a bond" are respectfully requested.

Further, the Examiner asserted that claims 1, 9, and 26 are indefinite in the phrase "one or more of the methylene groups is optionally replaced by...an NR_3 group, a CR_4 group, or a CR_5R_6 group" where the R groups can be "part of a ring" because it is not clear what is meant by the term "part of a ring group." The Examiner asserted that the instant specification does not define said group. The rejection is respectfully traversed.

One of ordinary skill in the art would understand that term "part of a ring group" refers to an atom or group that is bonded to other atoms or groups that form a ring system. For example, a carbon atom in a benzyl group is a part of a ring group. Particularly, for example, this terminology allows for the possibility of R_3, R_4, R_5, R_6, or combinations of the R groups, to jointly form a ring group. Applicants have attached as exhibits to this response several pages from Internet web sites showing exemplary use of the term "part of a ring structure." As used

throughout the attached print outs, the term "part of a ring structure" relates to an atom or group bonded to other atoms or groups to form a ring system. Moreover, U.S. patent subclass 536/26.11 relates to compounds where "phosphorous is part of a ring." For example, U.S. Patent No. 6,812,342 is classified in subclass 536/26.11, and Figs. 2 and 3 of the '342 patent depict a phosphorus group forming part of a ring structure (i.e., bonded to other atoms or groups in a ring). Thus, the term "part of a ring" structure or group is understood by one of ordinary skill in the art, and by the PTO, to mean an atom or group that is bonded to other atoms or groups to form a ring system. Since one of ordinary skill in the art would understand the scope of the term "part of a ring group," the specification is sufficiently clear. Reconsideration and withdrawal of the rejection of claims 1, 9, and 26 and claims 2-8, 10-16, and 27-30 as depending from claims 1, 9, and 26, respectively, due to the R groups being able to be "part of a ring" are respectfully requested.

Rejection Under 35 U.S.C. §102(b)

The Examiner rejected claims 26-30 under 35 U.S.C. §102(b) as being anticipated by Bouguettaya, et al., Journal of Applied Polymer Science, Vol. 73 (1999), pp. 1483-1492. Bouguettaya discloses the compound poly(N-glycidyl carbazole) where n is an integer of more than 1. The Examiner asserted that the compound is within the compositional limitations of the formula recited in the instant claims, in particular, in instant claim 30. The Examiner asserted that the compound is represented by the formula recited in instant claim 30 when n is more than one and the R groups are heterocyclic groups. Further, the Examiner asserted that the term "heterocyclic group" appears to read on "carbazolyl groups" substituted by other carbazolyl

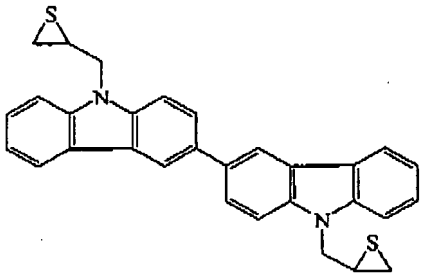
groups. The Examiner noted that Bouguettaya does not identify its compound as a charge transport material as recited in the instant claims, but asserted that it would be reasonable to presume that the reference compound has charge transport properties. The Examiner asserted that the burden is on applicants to prove otherwise. In re Fitzgerald, 205 USPQ 594 (CCPA 1980).

To anticipate a claim, each and every element as set forth in the claim must be found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). MPEP § 2131.

Claim 26 has been amended such that possible substituents on the carbazolyl groups can not be heterocyclic groups. Further, claim 30 has been amended to particularly remove "heterocyclic group" from the list of possible values for R_8 and/or R_9. The "heterocyclic group" substituent was positively listed and is therefore available for particular exclusion. The Bouguettaya et al. reference does not disclose or describe all the elements of independent claim 26 and, therefore, claim 26 is not anticipated. Claims 27-30 depend from claim 26 and contain all the limitations of claim 26 and are also not anticipated. Reconsideration and withdrawal of the rejection of claims 26-30 under 35 U.S.C. §102(b) are respectfully requested.

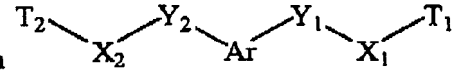
Claim Rejections Under 35 U.S.C. §102(e)

The Examiner rejected claims 26-30 under 35 U.S.C. §102(e) as being anticipated by U.S. 7,014,968 to Tokarski et al. (the "968 patent). The Examiner asserted that the '968 patent discloses a charge transport material of the formula



. The Examiner asserted that according to the '968 patent, compound 9 is formed by reacting the epoxy analog of compound 9 with ammonium thiocyanate. The '968 patent does not identify the epoxy analog of compound 9 as a charge transport material as recited in the instant claims. The Examiner asserted that the epoxy analog compound meets the compositional limitations recited in the instant claims and it is reasonable to presume that the epoxy analog compound has charge transport properties.

To anticipate a claim, each and every element as set forth in the claim must be found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). MPEP § 2131.

The '968 patent is directed to a discloses organophotoreceptors having the general formula  where Y_1 and Y_2 are, each independently, a bond, $-CR_1=N-NR_2-$, or $-CR_3=N-N=CR_4-$ where R_1, R_2, R_3, and R_4 comprise, each independently, H, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group;

X_1 and X_2 are, each independently, a linking group having the formula $-(CH_2)_m-$, branched or linear, where m is an integer between 0 and 20, inclusive, and one or more of the methylene groups is optionally replaced by O, S, C=O, O=S=O, a heterocyclic group, an aromatic group, urethane, urea, an ester group, an NR_5 group, a CHR_6 group, or a CR_7R_8 group

where R_5, R_6, R_7, and R_8 comprise, each independently, H, hydroxyl group, thiol group, an alkyl group, an alkenyl group, a heterocyclic group, or an aromatic group;

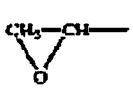
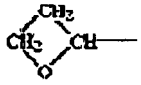
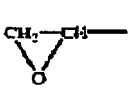
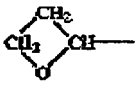
T_1 and T_2 are, each independently, a thiiranyl group, H, an alkyl group, an alkenyl group, or an aromatic group with the proviso that at least one of T_1 and T_2 is a thiiranyl group; and

Ar comprises an aromatic group with the proviso that when both Y_1 and Y_2 are a bond and one of T_1 and T_2 is not a thiiranyl group, Ar comprises a bis[(N,N-disubstituted)amino]aromatic group or a bicarbazole group.

The positions in the organophotoreceptors of the instant application held by an epoxy or oxiranyl group is held by, in the '968 patent, by a thiiranyl group, H, an alkyl group, an alkenyl group, or an aromatic group; but at least one of the positions must be held by a thiiranyl group. The '968 patent does not disclose an epoxy or oxiranyl group, except as a precursor to the organophotoreceptor containing the thiiranyl group. Nowhere in the '968 patent is it indicated that the epoxy-containing precursor could operate as an organophotoreceptor. Further, the notion that the precursor may be an organophotoreceptor is based upon the instant application and claims, and the use of impermissible hindsight. "To establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill...The mere fact that a certain thing may result from a given set of circumstances is not sufficient.'" In re Robertson, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). No evidence has been provided that the precursor compound would have been recognized as an organophotoreceptor. Hence, the '968 patent does not dieclose each and every element of claim 26, and claim 26 is not anticipated. Claims 27-30 dcpend from claim 26 and cotain all the

limitations of claim 26, and are also not anticipated. Reconsideration and withdrawal of the rejection of claims 26-30 under 35 U.S.C. §102(e) are respectfully requested.

Claim Rejections Under 35 U.S.C. §103(a)

The Examiner rejected claims 26, 28 and 29 under 35 U.S.C. §103(a) over U.S. Patent 6,416,915 to Kikuchi (the '915 patent). The Examiner asserted that the '915 patent discloses compounds 31 and 32 which comprise two chain-polymerization groups $-CH_2O-C(O)-CH=CH_2$. The chain-polymerization functional groups can equally be  or  . The Examiner further asserted that the '915 patent discloses hole transporting compound comprising at least two chain polymerization functional groups, i.e., compounds 23, 29, 31, or 32, forms a polymerizate. The Examiner asserted that it would have been obvious for a person of ordinary skill in the art, in view of the teaching of the '915 patent, to substitute the two chain polymerization functional groups $CH_2O-C(O)-CH=CH_2$ in compounds 31 or 32 with the equivalent chain polymerization functional groups  or  . Further, the Examiner asserted that the person would have and a reasonable expectation of successfully obtaining a hole transporting compound comprising at least two chain polymerization function groups that are capable of forming a polymerizate which when used in the surface of an electrophotographic photoreceptor improves the anti-abrasion and anti-scar characteristics of the photoreceptor. The Examiner asserted that the resulting hole transporting compounds that are

rendered obvious over the teachings of the '915 patent meet the compositional limitations of the formula recited in instant claims 26, 28, and 29 when Z is an aromatic group, E_1 and E_2 are oxiranyl, and X_1 and X_2 are $-CH_2OCH_2-$. Further, the Examiner asserted that the resulting compounds comprising the epoxy groups are represented by the formula in instant claims 26 and 28 when Z is an aromatic group and X_1 and X_2 are $-CH_2-$.

To establish a *prima facie* case of obviousness, "the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved...Such secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S._____ (2007), 82 U.S.P.Q.2d 1385 (S.Ct. 2007), citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1 (1966). In addition, the Supreme Court noted that the teaching, suggestion or motivation to combine test (TSM) may be helpful in determining obviousness. Considerations of the TSM test include some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; reasonable expectation of success; and the prior art reference (or references, when combined) must teach or suggest all the claim limitations. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). MPEP §2142. "There is no necessary inconsistency between the idea underlying the TSM test and the Graham analysis." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S._____ (2007), 82 U.S.P.Q.2d 1385 (S.Ct. 2007). In addition, "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some

rational underpinning to support the legal conclusion of obviousness". *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S._____ (2007), 82 U.S.P.Q.2d 1385 (S.Ct. 2007), citing *In re Kahn*, 441 F.3d 977, 988 (CA Fed.2006).

Further, "when obviousness is based on a single prior art reference, there must be a showing of a suggestion or motivation to modify the teachings of that reference." *In re Kotzab*, 55 USPQ2d 1313, 1316-1317, 217 F.3d 1365 (Fed. Cir. 2000). Respectfully, no such showing has been provided. There has been no showing of a suggestion or motivation to modify the teachings of the '915 patent. With the rather long list of examples of hole-transporting compounds having at least two chain-polymerization function groups, the compounds suggested by the Examiner as obvious could have been provided, but were not.

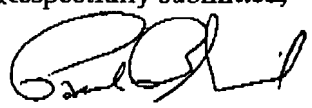
Further, claim 26 has been amended such that the '915 patent does not teach or suggest all of the claim limitations. Therefore, claim 26 is nonobvious. Claims 28 and 29 depend from claim 26 and are also nonobvious. *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). Therefore, reconsideration and withdrawal of the rejection of claims 26, 28, and 29 under 35 U.S.C. 103(a) are respectfully requested.

Conclusion

In view of the foregoing, it is submitted that this application is in condition for allowance. Favorable consideration and prompt allowance of the application are respectfully requested.

The Examiner is invited to telephone the undersigned if the Examiner believes it would be useful to advance prosecution.

Respectfully submitted,



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